

[0013] FIGS. 1E-H show the degradation of furfurylthioacetate at 38° C. (curves E and F) or 60° C. (curves G and H) in milk RTD coffee.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Generally, RTD coffee has less flavor and aroma than fresh coffee because aroma and flavor components are degraded during processing steps such as thermal processing and storage. It is now found that adding thioester flavor precursors such as methyl or furfurylthioacetates to RTD coffee before thermal processing improves the flavor and aroma and preserves those properties during storage, resulting in a fresher, cleaner, and more roasty and caramelized, but less bitter and ashy RTD coffee. This is a surprising result because these flavor precursors are expected to be degraded during thermal processing and storage. It has also been found that the level of the flavor precursor remains elevated during long storage. Furthermore, the level of the flavor molecule, either methylthiol or furfurylthiol, is also increased compared to control samples, as a result of precursor hydrolysis initiated by the acidity of RTD coffee. Due to the elevated level of the flavor precursors, the improved flavor and aroma effect is still perceived during consumption after more than 4 months at ambient temperature and for more than 1 month at 60° C. storage.

[0015] Accordingly, the present invention improves the flavor quality of a thermally processed coffee product by adding a thioester flavor precursor, preferably furfurylthioacetate, methylthioacetate, prenylthioacetate or a mixture thereof, present in an amount sufficient to provide improved flavor quality to the product for more than 4 months at ambient temperature and for more than 1 month at 60° C. storage.

[0016] In one embodiment of the present invention, the concentration of the flavor precursor in the coffee product to be thermally processed ranges between about 0.005 to 7 mg/kg, preferably between about 0.1 to 5 mg/kg.

[0017] The coffee product to be thermally processed in the present invention further comprises a coffee extract, a stabilizer, a buffer, and water, preferably reduced oxygen content water.

[0018] The coffee can be derived from roasted arabica, robusta, or any combination of beans, ground and instant powder, and preferably, in the form of concentrated coffee extract solids. The concentration of the coffee extract solids is approximately 0.5-20%, more preferably 0.75-1.5%, and most preferably 0.95-1.1% by weight. These solids are dissolved in water to form the liquid product. The water is between approximately 80-95%, more preferably between approximately 85-92%, and most preferably between approximately 85-90% by weight of the total product.

[0019] The product further comprises buffers such as water-soluble potassium or sodium salts to adjust the pH. Any water-soluble buffers can be used. In addition to the potassium or sodium salts others such as potassium or sodium carbonate, potassium or sodium bicarbonate, dipotassium or disodium hydrogen phosphate, potassium or sodium dihydrogen phosphate, tripotassium or trisodium phosphate, potassium or sodium hydroxide, potassium or sodium succinate, potassium or sodium malate, potassium or sodium citrate, and mixtures thereof. Preferably, the buffer is selected from the group consisting of sodium or potassium bicarbonate, sodium or potassium carbonate, sodium or potassium citrate, and disodium or dipotassium hydrogen phosphate. The pH of the

finished product is typically adjusted to between approximately 6 and 8 and preferably between 6.5 and 7.7. The potassium or sodium salt may be present in an amount of from about 0.1% to about 0.2% by weight of the total composition.

[0020] The product may also comprise a stabilizer. The stabilizer may contain conventional emulsifiers and gums and may also contain an optional milk derivative.

[0021] The product may generally comprise a sweetener or a combination of sweeteners. The sweetener may be any sweetener normally used in food processing, either natural or artificial, for example sugar alcohols and sugars such as sucrose, fructose, dextrose, maltose, lactose, high fructose corn syrup solids, erythritol, or mixtures thereof. The sweetener may be any suitable synthetic or natural sweetener, which may be a higher intensity sweetener and used in combination with the sugar or sugar alcohol. Examples of such sweeteners include, for example, sucralose, acesulfame potassium (acesulfame-K), and mixtures thereof. The sweetener may further comprise a mixture of natural or synthetic sweeteners, such as a sugar or sugar alcohol, used in combination with, for example, a high intensity sweetener. Any mixture or combination of natural or artificial sweeteners may be used. Other sweeteners normally used in food or beverage processing can be used if desired. Preferably the sweetener is selected from the group consisting of sucrose, dextrose, fructose, high fructose corn syrup, sucralose, and acesulfame-K. Typically, the sweetener will be present in an amount or amounts to provide a desired sweetness and a typical range is from about 0.5% to about 6% by weight of the total composition.

[0022] When a whitened coffee product is desired, the product may further comprise a whitener. Whiteners can include milk, cream, whey, yoghurt, ice cream, emulsifiers, maltodextrins, pectins, natural and synthetic gums and natural or chemically modified starches or mixtures thereof. Preferably, the whitener is milk, cream, non dairy creamer, soymilk, rice milk, and coconut milk.

[0023] The product may further comprise fortifying with vitamins. Any vitamin normally used in food processing can be used, such as but not limited to, ascorbic acid, biotin, folic acid, niacinamide and riboflavin. The most preferred vitamin used in the product is ascorbic acid.

[0024] The product may further comprise a flavor component, either natural or artificial, as may be desired, such as almond, amaretto, anise, apple, brandy, caramel, cappuccino, cider, cinnamon, cherry, chocolate, chocolate mint, cocoa, coffee, creme de menthe, french vanilla, grape, hazelnut, irish cream, lemon, macadamia nut, mocha, orange, peach, peppermint, pistachio, strawberry, vanilla, wintergreen or mixtures thereof. Any other flavor normally used within the food or beverage processing industry may be utilized. Preferred flavors for the product include almond, amaretto, caramel, cappuccino, cider, cinnamon, chocolate, chocolate mint, cocoa, coffee, creme de menthe, hazelnut, mocha, peppermint, vanilla or mixtures thereof. The most preferred flavors include cocoa, vanilla, caramel and chocolate mint. Typically, the flavor or flavors are present in an amount of from about 0.1% to about 1% by weight of the total product.

[0025] The invention also relates to a method of delivering aroma and flavor to ready to drink coffee beverage comprising coffee extract, stabilizer, buffer and water, which comprises (1) adding a thioester precursor of the general structure $R-S-CO-R'$ to the beverage, wherein R is selected from the group of methyl, ethyl, propyl, isopropyl, prenyl, furfuryl,